

GEORGE WASHINGTON UNIVERSITY



Mecheleciu

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BUREAU OF STANDARDS TRIP MAY 14

Mecheleciu

The MECHELECIU is published monthly by two undergraduates of the School of Engineering of the George Washington University

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THANKS!

This is the last issue of the MECHELECIU until October. Rather than regale your ears with an editorial, we would like to take this space to thank the people who have by their support and help made it possible for the MECHELECIU to grow some this year.

Thanks to Dean Feikier for his always inspiring columns, constructive criticisms, financial planning and aid, and his unwavering support. To Dr. A. F. Johnson for the use of his office, his Job-like patience with a messy staff, and his constant encouragement; to Professor N. E. Ames for obtaining a new space for the staff to work (when we can find the furniture to put in it); to Professor Akere, Professor Walther, Professor Greeley, Mr. Kohlross and all of the others who have given so generously of their time and aid, again we say "Thanks!"



Dean Frederick M. Feikier in conference.

OUR COVER

High current in the high voltage lab; corona exhibited by a number 18 copper wire with 50,000 amperes through it is only temporary. A moment later, the wire vaporized. The current was supplied by a surge current generator which is capable of supplying 200,000 amperes for a short period of time. The wire was a little over 12 feet long. Photograph courtesy of the National Bureau of Standards High Voltage Laboratory.

DEAN'S COLUMN

A CHALLENGE TO LEADERSHIP

Success is sobering. In the flush of an election victory or an appointment to a post of authority, the feeling of accomplishment is quickly followed by a deep sense of responsibility. The School of Engineering has been honored by the election of Fremont Jewell to the presidency of the Student Council of the greater University. This evidence of leadership becomes at once both a reason for congratulation and a challenge to service.

All urban universities seem to share with our own the problem of divided loyalties - loyalties to Schools and Colleges, loyalties to sororities and fraternities, loyalties to individuals. In general these loyalties rest on traditions of service or of intimate association and common interests.

The challenge is how to merge these loyalties into the larger purposes of the greater university. Certainly there is nothing to be gained by discounting the loyalties we now possess. The problem is to find the common denominators of those loyalties and emphasize and expand them.

In the past it has seemed that the greatest common denominator has been something in common to fight. Those who glorify the arts of war rest their claims on the willingness of factions, groups, and races, to merge their collective selfishness in a common patriotism. If there is not abundant proof in the daily press that this is an outward answer to an advance in civilization, no argument of mine would be convincing.

If the engineer collectively and individually has some trait to add to leadership, it is found, not in fighting something old, but in building or creating something new. In all humility, it seems to me that the challenge to the School of Engineering, to the greater University and to civilization, is to drop the watchword "fight" and to adopt the motto "build".

This is the challenge of the day. It is bigger than any individual, bigger than any school or college. It is a thing of the spirit. If we accept the challenge in that spirit, we will all find the answer.

- Dean Fredrick M. Feikier

Professor B. D. Greenshields has contributed a fine article on traffic flow studies to this issue, and more articles by faculty members are planned for next year.

CALENDAR

MAY

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HOBBY GROUP PLANS CAMPAIGN

The hobby shop has taken big strides toward becoming a reality. At a forthcoming meeting, the hobby shop committee will make public its many interesting facts and figures.

The response to the recent hobby questionnaire was gratifying, but it failed to stimulate those of you who do not yet have a hobby. You need a hobby! A hobby is a fascinating activity that pays you in pleasure and mental alertness. Regardless of whether you are carrying three credit hours and have the time and money to participate on a large scale, or are carrying twenty hours and wish to work occasionally on a modest project, you will experience a deep satisfying sense of enjoyment.

In a recent article in the American Magazine, Mr. Boris Blai, director of the School of Fine Arts at Temple University, says "... I am convinced that every human being possesses a creative urge, and that this urge can be brought out and put to work with encouragement. Suppression of it results in maladjustment." Mr. Blai goes on to say: "One reason so many of us are so despondent worried and jittery today is that we are using our heads too much and our hands too little. You were given hands to work with and when a man lets them grow useless and clumsy, he is trying to buck nature — and he pays with neuroses."

Come to the Engineers' Banquet

MAYO-WELLS ADDS "COCKNEY" FLAVOR

W. J. Mayo-Wells is our most recent international addition to the electrical engineers. Born in London England, he qualified as a cockney having been born "within the sound of Bow Bells."

Mayo, as he likes to be called, was a student at Radley College and The London Electrical Engineering College known as Fareday House. From the latter he spent a year with General Electric as a test student. His interest in radio was aroused while a member of the signal group of the Radley O.T.C., but it was not until his second position that Mayo was again associated with radio. At Marconi's in Chelmsford, Essex, he worked in the research and development section devoted to high power broadcast transmitters.

Five years later at the outbreak of war Mayo-Wells volunteered to work as

ALL ENGINEERS INVITED

N.B.S. TRIP MAY 14

Only once in four years! The electrical laboratories of the National Bureau of Standards will be open to the Engineering students (and gal friends) on the evening of May 14.

Recent developments in high voltage, electronics, radio-activity and X-ray research will be on display in addition to the regular electrical equipment, used in standardization. Some of the developments, particularly in electronics, have only recently been released from security restrictions and heretofore have not been shown publicly.

The ordnance section will include in its display the historical exhibit of

the V.T. fuse and Guided Missiles, including the "Bat".

The High Voltage laboratory will be the "hot spot" where 2,000,000 volts and 200,000 amperes will be harnessed and made to perform electrical gymnastics such as were on display at the world fairs.

The guided trips through the laboratories will be started at intervals between 7:30 and 8:15 from Room 143 of the Materials Testing Building, located just inside the gate at Van Ness Street and Reno Road. Those who can are requested to come during the early part of the interval in order that the guide service may be efficiently utilized.

by John Le Reche

ENGINEERS ARE PEOPLE

JEWELL FINDS INTEREST IN BRIDGE DESIGN



Newly-elected president of the Student Council Fremont Jewell is one of the best known students in the engineering school. His smile and friendly greeting have won him many friends since he has been at George Washington.

Fremont's highly varied life started in Minnesota. He was graduated from Central High School in St. Paul, and continued his studies at the University of Minnesota. The desire to see the world led Fremont to go to New Orleans where he sailed as a seaman on boats between New Orleans and New York. After three months, he found a position in New York state, doing highway work. A half year later, again in Minnesota, he went to work for the Minnesota Mining and Manufacturing Company doing white collar duty on a construction project.

April 1943, Fremont went to Wyoming to work on a dam, and the following fall resumed his engineering studies at the University of Omaha. After a year and a half, he returned to Minnesota to work for the State Highway Department. In 1941, when war threatened, Fremont went to work at a bomb-loading plant in Iowa.

His military career started in 1942, and in 1943 was awarded his wings in the Army Air Forces. He went to England where he served with the 8th Air Force.

He was shot down and wounded on his third mission over Kiel, Germany. After 13 months as a war prisoner, he was repatriated and returned to the United States on the Gripsholm. After six months at Walter Reed General Hospital, Fremont was retired from the army in July 1945. Another hospital stay was required before he was able to resume his educational career, this time at George Washington, but still in civil engineering.

Fremont's interests lie in bridges and highway work. He visualizes bridges not only as an engineer, but also as an architect, looking forward to the use of fewer vertical supports and the principle of slab and plane. He pointed out that several bridges spanning Rock Creek Park are built on these principles.

In addition to scholarly pursuits, Fremont also finds time for hobbies — photography and radio — and participation in many of the school's activities. He is a member of Theta Tau, treasurer of Sigma Tau, the engineering honorary, and is serving on several committees of the ASCE.

(Continued on page 7)

ENGINEER WINS TOP COUNCIL JOB

Announcement of the election of Fremont Jewell, CE '48, as president of the student council climaxes a year of intense activity in the post-war engineering school. This reawakening has ended a nine year period of lethargy in University affairs. Not since 1939 has the engineering school had a voting representative in the student government.

Jewell, running on the All University ticket, won by an 821 to 714 count over runner-up Larry Woodward. Jerry Brastow was third with 242 votes.

Reorganization of elections, change of certain council policies, and representation on minor council posts by students of all the university divisions were principal planks of the Jewell Platform. Among the minor appointive posts are assistants to each council representative, the book exchange staff and the Handbook staff.

Dissatisfied with the small number of votes, Jewell believes that more publicity in future elections will lead to fairer politics and a chance for voters to learn the qualifications of each candidate and his platform. Though only 1819 votes were cast, this represents an increase over previous University elections.

Dwin Craig, EE '48, also on the All U ticket was defeated by Jim Speake, 958 to 804.

Jewell and Craig have expressed their appreciation to the support shown by the School of Engineering in the election.

A STUDY OF TRAFFIC

Bruce D. Greenshields, Ph. D.

Understanding of how to alleviate traffic congestion cannot be gained from casual observation, but must come from careful analysis of quantitative measurements. In contrast to laboratory research where rigid controls support an exacting scientific approach, traffic behavior must be studied in the field, where it occurs. To cope with this difficulty the traffic engineer relies on the tools of statistics and the science of sampling.

In order to gain further knowledge of the geometry of traffic flow at urban intersections, the Yale Bureau of Highway Traffic in 1944 (Editor's note: under the direction of the author) began a statistical study of vehicular movement. From the beginning of the project it was apparent that the one essential attribute of traffic, relative motion, must be measured in terms of time and space. Acceleration, capacity of intersections with stop signs or traffic lights, minimum spacing between moving vehicles must all be explained in terms of relative motion. The task was to observe them in the field and later to analyze the measurements of motion.

As a means of recording field data, pictures of traffic movement were taken at short successive time intervals. The equipment, mounted on high buildings next to the intersection, consisted of an Eastman Cine Kodak Special 16mm Camera with an auxiliary timing mechanism. A convenient film speed of 88 frames per minute was selected. Distances each vehicle would travel, in feet, between two frames of the film then would equal its speed in miles per hour.

For measuring space relationships the street and intersection areas were marked by grid or scale lines so that they would appear in each picture and thus give the objection that permanent grid lines might distract drivers, temporary guide lines in chalk were drawn across the street at intervals of twenty feet. A picture of these marks served as a base for a grid drawn on a screen made of white drafting paper on which the successive frames of the film were projected for analysis.

METHOD OF ANALYSIS

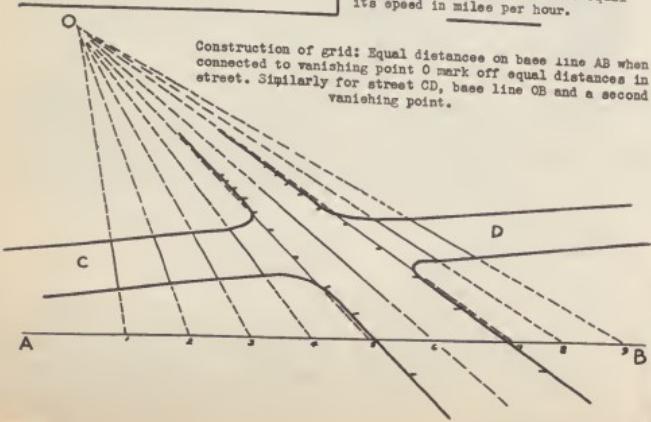
The application of time-space study to traffic problems is illustrated by the procedure involved in analyzing one aspect of driver behavior, starting performance of vehicles at urban intersections.

The films to be studied were run thru the projector rapidly, and vehicles starting without hindrance were selected.

The positions of the vehicle on the street were indicated from the grid onto which pictures were projected. Speed in miles per hour at any point was given since it was equal to the distance in feet travelled in 1/88 minute. In this example, the driver started movement 3/88 minute after the signal changed to green, and reached 15 mph in 8/88 minute. Such information, combined with similar data from other vehicles gave a curve of average starting performance. The same general procedure of reading films and recording data was employed in all phases of the study.

The capacity of a signalized intersection was measured in this study by determining the time-space headways between successive entering vehicles. After the light changes to green, the entrance headway time required per vehicle was found to vary from 2 to 4 seconds. The first few vehicles in line consumed more time than the others since the first start from rest, while the latter have accelerated to normal speed before reaching the intersection.

For this reason, longer "go" periods on one street mean longer "stop" periods on the other street, and accordingly increased total delay. Optimum timing requires the shortest signal cycle which will accommodate the existing traffic, and the quantitative results of this study may be used for such a determination.



(Continued on page 8)

G.W. STUDENT HAS ARTICLE IN "CIVIL ENGINEERING"

by Matt Polk

Erwin Shalowitz, student in the Civil Engineering School here at George Washington, is the author of an article which is to be published soon in the magazine CIVIL ENGINEERING. The title of this article is "Harnassing the Geography of the Jordan". It is concerned with the diversion of the waters of the Mediterranean Sea to compensate for the loss of waters of the Jordan to the Dead Sea; thereby producing a combined irrigation and hydro-electric power project.

A quotation from the opening paragraph of the paper gives the best insight into its interesting and far reaching aspects. "While statesmen are concerning themselves with the political future of Palestine, a contributing factor to a just solution must inevitably be the ability of the country to absorb large scale immigration. The question of the economic absorptive capacity of Palestine is not a new one, but it is only in the last few years that a technological approach has been made to the problem

and a plan developed by which the present population of the country can be increased by two to three million."

There are two major technical aspects treated in Mr. Shalowitz's article. The first deals with the diversion of Jordan River water into a network of canals which will carry the water to unirrigated areas and also develop a limited amount of power. The second phase is a large-scale hydro-electric power development. The latter is brought about through the unique plan of bringing water from the Mediterranean Sea to the Dead Sea. By so doing, the loss of water from the Jordan River is compensated for and the drop in head is utilized for the production of power. It is expected that the combined project could produce in excess of one billion Kwh hours per year.

As has been suggested above, the article is of interest not only in its technical proposals, but also in offering a possible solution to a worldwide political problem. Erwin pre-

sented the original article at a joint electrical-civil engineering seminar last December. Upon the advice of Professor Akers, he revamped it to

make it more suitable for publication. The Editor of CIVIL ENGINEERING has indicated that it will appear in about two months.

Erwin is a senior and expects to graduate at the end of this semester. He attended Roosevelt High School here where he was active in the cadets and on the debating team. While in the engineering school at George Washington, he worked for a while at the Army Map Service.

His experience in the Navy included being Assistant Engineering Officer on destroyer. He also had periods of schooling at the University of Pennsylvania, the University of Notre Dame and the Torpedo Officers' School at San Diego. At present his extra-curricular activities include membership in the A.S.C.E., Sigma Tau, and Phi Alpha.

ENGINEERING LESSON #1

This is a slide rule



M.E.'S ATTEND REGIONAL MEET

Five mechanical engineers of George Washington University attended the annual Regional Conference of ASME Student Branches at Philadelphia on April 17.

Accompanied by Prof. Cruickshanks, Prof. Turnbull, and Prof. Gresley, the group consisting of Nancy Larson, Harbert Murray, Frank Weatherbee, Ben Cruickshanks, Jr., and Robert Sugg inspected the Baldwin Locomotive Works at Eddystone, Pa., on the afternoon of April 16.

The tour started with the Diesel erection shop, including locomotives for export to France and a single unit, 6000 hp locomotive. The steam erection shop and the foundry, which featured concrete molds for ship propellers, were also on the itinerary.

After spending the night at the Penn-Sheraton Hotel in Philadelphia, the group attended the technical sessions, luncheon and banquet on the 17th.

Hosts to the meeting were the Philadelphia Local Section, ASME, and the Villanova Student Branch. A special award was won by J. E. Risegel of Penn State for a paper on "Energy Balance", in which the functions of the human body were clearly and completely explained in thermodynamics terminology. Herb Murray of GWU presented a paper on "The History of the Diesel Locomotive".

SIGMA TAU

On the basis of scholarship, practicality, and sociability, the following men have been honored by being pledged to the Engineering honor fraternity:

- J. M. Bane
- D. Blanchard
- B. W. Bratt
- B. H. Eakin
- R. E. Kemelhor
- C. Cancro
- J. Hunter

They will be initiated on May 10 and will receive their keys at the Engineers' Banquet.

The new officers of Sigma Tau for 1947-48 are:

- President - Malcolm Hodges
- Vice Pres. - Will Hauser
- Recording Sec'y. - Norman Matlow
- Corresponding Sec'y. - Irvin Lilijgren
- Treasurer - Franklin Jswall
- Historian - Bob Manville
- Engineers' Council - Bob Kantz
- Ben Sorin

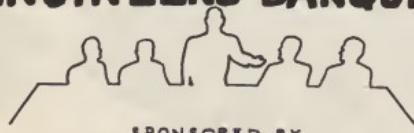


The last meeting of the current semester of the IRE passed a resolution to continue the same officers throughout the summer session. .

N. J. Mayo-Wells was the speaker, bringing many very interesting experiences and anecdotes about the beginnings of radar.

You are cordially invited to attend the "

NINETEENTH ANNUAL ENGINEERS' BANQUET



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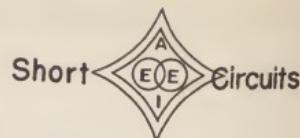
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All important to next year's ME activities are the officers that you will select that the May 7th meeting to guide the society. Chairman Clifton Williamson has appointed George Pida, George Kaly, and Alfred Barauck to serve as a nominating committee. Nominations may also be made from the floor.

The program for the meeting will include two student papers. Leonard Summers will speak on "Tube Noise Measurements below Thirty Cycles" and Irving Steele will present "RCA Color Television".

Concluding the year's program will be the long awaited field trip on May 14th to the National Bureau of Standards.

THETA TAU

Theta Tau will be host to the graduating seniors on Saturday, May 24th. A stag party will be the setting for honoring Alfred Barauck, Felix Geissler, Barratt Kreisberg, Frank Weatherbee, Bernard Bernstein, George Kaly, George Pida, Jack Lane, and Ted Nelson.

Officers were selected at the last meeting. Those who will guide Theta Tau during the coming year are:

- Regent - Don Blanchard
- V. Regent - Merrill Brown
- Scribe - Allan Ensign
- Eng. Council - Dick Shaw
- Eng. Council - Harold Thomasson
- Treas. - Dan McBride
- Ast. Treas. - Elmer Sundey

And this last bit of news: Richard Shaw takes unto himself a wife. The best of everything, Paula and Dick!

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MAYO-WELLS

(Continued from page 3)

a radio engineer for the British Minister of Aircraft Production, under whose direction all research for the Air Ministry was undertaken. Mayo at once joined the early pioneers of radar where his work included setting up mobile search radars, and in tracking down spurious transmissions. It was while employed on the latter job that he spent some time in an unarmed plane circling over one of the main radar chain stations. On landing, he was surprised to learn that five German fighters had also been circling the site thousands of feet above his plane.

Mayo's next job took him into the heart of the 1940 blitz. As he was engaged in improving the performance of primitive gun-laying radar with the heavy AA batteries around London and other major cities.

Suddenly he was ordered to Egypt, where, with a temporary commission in the Royal Air Force, he was radar advisor attached to Middle East Headquarters. Mayo will never forget the voyage out. On the aircraft carrier *Furious*, he witnessed a dawn attack on the convoy by a German cruiser. The day was Christmas Day, 1940, but Mayo spent it aloft keeping a sharp lookout, while the carrier plunged through heavy seas in an effort to locate the fleeing enemy.

Probably, fortunately for the *Furious*, a converted merchantman and no match for a cruiser, the chase proved in vain. Taking a short cut through the Mediterranean on a destroyer with a convoy, Mayo witnessed the sinking of an Italian destroyer, after a gallant fight against superior odds. Just at breakfast, the first of a series of vicious air attacks sent them scurrying to action stations. These attacks lasted until dusk, and though the fleet suffered damage, the convoy was unscathed.

After a little over a year in the Near East, Mayo returned to England, flying across Africa from Cairo to Lagoa, and thence by sea. Returning to the Telecommunications Research Establishment he was engaged in radio counter measures, later used with great success for decoy attacks on D-Day from TRE he joined the Operational Research Group at RAF Bomber Command Headquarters and aided in the adoption of various navigational systems, including

MEET YOUR PROFESSOR

by John Le Reche

"There is more to be learned in a university than is taught in class. Engineering students should take more interest in extra-curricular activities or part time employment. The broadening influence of either is well worth the time spent."

These are the words of our youngest instructor, Frederick H. Kohlross, who joined the mechanical engineering faculty in February of this year. Although he was born in Texas, and attended high school in Philadelphia and Kansas, more recently has been a resident of Bethesda, Maryland.

Mr. Kohlross likes girls. Besides his lovely wife, his 23-month-old daughter Margaret, the homestead has been newly blessed with the arrival of Charlotte on April 18. When asked for a statement, Miss Charlotte had "no comment".

Interested in writing and publication work, he is carrying ten hours of law courses here at CW as a means of broadening his education. He intends to further his training with a master's degree in mechanical engineering, after completion of the law school work.

He likes teaching and finds it a stimulating profession. Now teaching descriptive geometry, his courses will be thermodynamics and mechanical drawing during the summer.

GEE and OBOE. Later Mayo was advisor on airfield control systems and was engaged on the vital problem of how to land the heavy bombers returning from a raid in bad weather. While with Bomber Command, Mayo cooperated with a similar group at the HQ of the 8th Air Force and made many trips to U.S. bases.

From Bomber Command, Mayo came to this country as a member of the British Air Commission, Radar and Radio Section, and was given the opportunity of cooperating with many of the leading manufacturers and government and science research sections. With the end of the war in sight, Mayo resigned from his position to start work at the Applied Physics Laboratory of Johns Hopkins University engaged in telemetering for guided missiles.

Mayo is married to the former Jean Olds, a graduate of Syracuse University and a member of Phi Beta Kappa, who, with their son, returned to this country in 1940 when only the channel remained between the enemy and their home on the seacoast at Swanage.

Mr. Kohlross is married to the former Peggy Grunwell, ex-CW student. He has just purchased a new home in Green Acres, Maryland, and has been busy adding new features as only a mechanical engineer can.

He was graduated from the University of Maryland in 1943 with a B.S. in mechanical engineering, specializing in aeronautics. While in college, he was a member of Sigma Alpha Epsilon fraternity, served on the interfraternity council, was news editor of the school newspaper, became a member of Pi Delta Epsilon, honorary journalism fraternity, edited the student handbook, and was on the staff of the yearbook.

During summer vacations, he worked on survey parties and was a survey draftsman. Mr. Kohlross was also active in intra-mural sports, the background for which he received as a member of high school football, basketball, and baseball teams.

He served in the Army for three and a half years, and saw duty both in Europe and in the Pacific. With the 14th Armored Division, he served as a Lieutenant in the Engineers, doing bridge and road repair, and mine removal. For nine months, his little Nipponese orderly greeted him daily with a smiling "Konichi-wa!", and was rewarded with remarks about the point system.

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TRAFFIC STUDY

(Continued from page 4)

CAR UNITS

On entering an intersection all types of vehicles do not perform in the same manner. For example: trucks in general take 1.5 times as long as passenger cars. A truck thus equals 1.5 passenger car "units". The quantitative value of various traffic factors may be measured and related to each other.

In this study, the green interval of the traffic signal was apportioned among three demands:

1. Passenger cars
2. Buses and trucks
3. Left turning movements

The questions to be answered were: first, how much intersection green time does each consume, and second, how are these consumptions related to one another?

The advantage of common units becomes apparent when it is desirable to adjust signals for variations in the volume and composition of traffic or for the proportion of left turning movements. Congestion will be avoided as long as the number of traffic units delivered to the intersection per cycle is less than the intersection can handle.

CLEARANCE

While stopped, vehicles are separated by four or five feet, but few drivers travel so closely when going at higher speeds. The minimum distance clearance between vehicles increases directly with their speed. In contrast, time clearance between vehicles is constant at about one second. Since perception-reaction time is about one second, this would suggest that drivers feel that they can come to a stop as quickly as the car ahead and allow only a reaction time spacing.

At many intersections the volume of traffic does not warrant signal lights and the "stop sign" is the most common other regulation. Observations were made to determine the minimum "gap" in traffic required to allow the passage of a vehicle on the "stop"

streets. The results of this investigation show that on the average a clear spacing of about six seconds is needed. Therefore, in order to determine delay for the stopped vehicle, it is necessary to ascertain the number of such gaps appearing in opposing traffic.

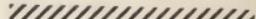
For this purpose, as well as for many others, it is desirable to determine the law which governs the spacing of traffic on a roadway. Highway traffic does not distribute itself perfectly along the road; there is always some degree of vehicular bunching. The spacing relationships that exist in traffic streams as they move along have been found to conform closely to Poisson's law of "random series". Using this mathematical tool, the analyst may predict within close limits, for example the delay suffered at intersections, either "stop signed" or signalized.

In summary, perhaps the most significant thing to come out of the entire study has been the fact that the time-space relationships found in traffic tend to follow definite statistical patterns. With such measurements, it is possible to make the best use of existing traffic facilities and to determine when, outgrown or outmoded, they should be replaced.

The April meeting of ASME was held in conjunction with AIEE and ASCE. Dr. George A. Gamow, of the department of physics, presented an entertaining and informative lecture on "Nuclear Engineering" to an overflow crowd of several hundred.

The May 7th meeting will feature election of officers for the next school year. There will be a short business meeting followed by - guess what - the usual refreshments.

All those who have been unable to obtain invitations to the Second Annual Mechanical Engineers' Stag following the Engineers' Banquet on May 10th, will find eager ticket salesmen haunting them.



Come to the Engineers' Banquet.



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